Efficient Computation of Range Aggregates Against Uncertain Location Based Queries in Multi Dimensional Space

R.Saravanan, S.Gokulakrishnan, T.V.Sampath

***Abstract*— In many applications, including location based services, queries may not be precise. In this paper, we study the problem of efficiently computing range aggregates in a multidimensional space when the query location is uncertain. Specifically, for a query point Q whose location is uncertain and a set S of points in a multi-dimensional space, we want to calculate the aggregate (e.g., *count, average* and *sum*) over the subset S^I of S, Q has at least probability θ within the distance γ to p. We propose novel, efficient techniques to solve the problem following the *filtering-and-verification* paradigm. In particular, two novel filtering techniques are proposed to effectively and efficiently remove data points from verification. Our comprehensive experiments based on both real and synthetic data demonstrate the efficiency and scalability of our techniques.**

***Index Terms*—Space, Multi Dimensional, PDFs.**

I. INTRODUCTION

Query imprecision or uncertainty may be often caused by the nature of many applications, including location based services. The existing techniques for processing location based spatial queries regarding certain query points and data points are not applicable or inefficient when uncertain queries are involved. In this paper, we investigate the problem of efficiently computing distance based range aggregates over certain data points and uncertain query points as described in the abstract. In general, an *uncertain query* Q is a multi-dimensional point that might appear at any location x following a probabilistic density function pdf(x) within a region Q.region. There is a number of applications where a query point may be uncertain. Below are two sample applications.

II. MOTIVATING APPLICATION 1

A blast warhead carried by a missile may destroy things by blast pressure waves in its *lethal area* where the lethal area is typically a circular area centered at the point of explosion (blast point) with radius γ and γ depends on the explosive used. While firing such a missile, even the most advanced laser-guided missile cannot exactly hit the aiming point with 100% guarantee. The actual falling point (blast point) of a missile blast warhead regarding a target point usually follows some probability density functions (PDFs); different PDFs have been studied in [24] where *bivariate normal* distribution is the simplest and the most common one. In military applications, firing such a missile may not only destroy military targets but may also damage civilian objects. Therefore, it is important to avoid the civilian casualties by estimating the likelihood of damaging civilian objects once the aiming point of a blast missile is determined. Points {pi} for $1 \leq i \leq 7$ represent some civilian objects (e.g., residential buildings, public facilities). The actual falling point of the missile, then objects p1 and p5 will be destroyed. Similarly, objects p2, p3 and p6 will be destroyed if the actual falling point is q2. In this application, the risk of civilian casualties may be measured by the total number n of civilian objects which are within γ distance away from a possible blast point with at least θ probability.

III. MOTIVATING APPLICATION 2

Similarly, we can also estimate the effectiveness of a police vehicle patrol route using range aggregate against uncertain location based query Q. For example, the possible locations of a police patrol vehicle in a patrol route. A spot (e.g., restaurant, hotel, residential property), represented by a point in {p1, p2, . . . , p7} is likely under reliable *police patrol coverage* [11] if it has at least θ probability within γ distance to a moving patrol vehicle, where γ and θ are set by domain experts. The number of spots under reliable *police patrol coverage* is often deployed to evaluate the effectiveness of the police patrol route.

IV. PROPOSED SYSTEM:

Our techniques will be presented based on the aggregate *count*. Nevertheless, they can be immediately extended to cover other aggregates, such as min, max, sum, avg, etc. In this application, the risk of civilian casualties may be measured by the total number n of civilian objects which are within γ distance away from a possible blast point with at least θ probability. It is important to avoid the civilian casualties by estimating the likelihood of damaging civilian objects once the aiming point of a distance (km) is determined.

V. ADVANTAGES

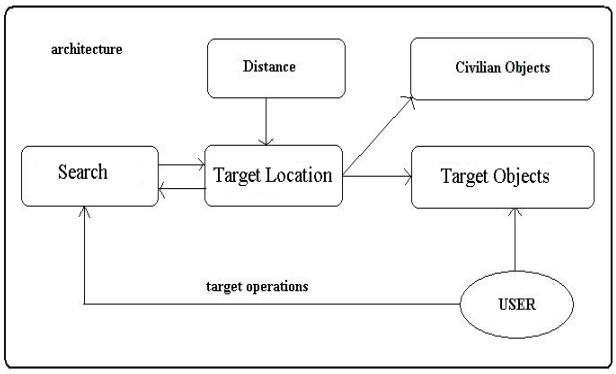
- ✓ Avoid damaging civilian objects.
- ✓ Filtering technique is applied.

R.Saravanan, Assistant Professor, Dept. of IT SCSVMV University, Enathur Kanchipuram.

S.Gokulakrishnan, Assistant Professor, Dept. of IT SCSVMV University, Enathur Kanchipuram.

T.V.Sampath, M.Tech Final year, Dept. of IT SCSVMV University, Enathur Kanchipuram

ARCHITECTURE



VI. ALGORITHM

Filtering-and-Verification Algorithm:

This motivates us to follow the *filtering-and-verification* paradigm for the uncertain aggregate query computation. Particularly, in the *filtering phase*, effective and efficient filtering techniques will be applied to *prune* or *validate* the points. The algorithm consists of two phases. In the *filtering* phase for each entry e of RS to be processed, we do not need to further process e if it is *pruned* or *validated* by the filter F. We say an entry e is *pruned* (*validated*) if the filter can claim $P_{fall}(p, \gamma) < \theta$ ($P_{fall}(p, \gamma) \geq \theta$) for any point p within e_{mbb}. The counter cn is increased by |e| if e is *validated* where |e| denotes the aggregate value of e (i.e., the number of data points in e). Otherwise, the point p associated with e is a candidate point if e corresponds to a data entry and all child entries of e are put into the queue for further processing if e is an intermediate entry. The *filtering phase* terminates when the queue is empty. In the *verification* phase candidate points are *verified* by the integral calculations.

VII. MODULES

A. .Filtering and verification:

When User wants to Search any Civilian Objects like Hotels, Hospitals, Banks, etc., to generate & verify the database then gave exact details. If, he wants to Advanced Search, to give exact range values, apart from that civilian objects details to be displayed with Civilian Objects categorized and calculate the distance details.

B. Query Processing:

Admin Verify the User Requests and check the user requests is contain in our database or not. If the database contains the user requests to calculate the Range (Distance) value, and then send Response to the Appropriate Values, suppose the request doesn't contain in the database send response is 'Record Not Found' that query sent to the particular User.

C. Response Results:

User Verify the Admin Responses and the user requests is match with database the query produce with the Correct Results and Download the word file, otherwise not download. If the database contains the user requests to calculate the Range (Distance) value, suppose the request doesn't contain in the database received response is 'Record Not Found' but if matching results are retrieved.

D. Upload Civilian Objects with Distance:

Admin can upload the Civilian Objects details with Correct Location (area), Address, Phone and Upload Civilian Objects Profile (.doc) file. If calculate distance in one location to another location so the admin entry the details for distance and admin can view the User Details also.

VIII. INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:'

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

IX. OBJECTIVES

1.Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

3.When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

X. OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be

developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2.Select methods for presenting information.

3.Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- ✓ Convey information about past activities, current status or projections of the
- ✓ Future.
- ✓ Signal important events, opportunities, problems, or warnings.
- ✓ Trigger an action.
- ✓ Confirm an action.

XI. CONCLUSION

In this paper, we formally define the problem of uncertain location based range aggregate query in a multidimensional space; it covers a wide spectrum of applications. To efficiently process such a query, we propose a general filtering and verification framework and two novel filtering techniques, named *STF* and *APF* respectively, such that the expensive computation and IO cost for verification can be significantly reduced. Our experiments convincingly demonstrate the effectiveness and efficiency of our techniques.

REFERENCES

[1] G. Kang, J. Liu, M. Tang, X.F. Liu, and K. K. Fletcher, "Web Service Selection for Resolving Conflicting Service Requests," in Proc. 9th Inter-national Conference on Web Services, Washington, DC, USA, July, 2011, pp. 387-394.

[2] Z. Zheng, H. Ma, M. R. Lyu, and I. King "QoS-Aware Web Service Recommendation by Collaborative Filtering", IEEE Trans. on Services Computing, 2011, vol.4, no.2, pp.140-152

[3] J. L. Herlocker, J. A. Konstan, J. Riedl, "An Empirical Analysis of Design Choices in Neighborhood-based Collaborative Filtering Algorithms," Information Retrieval, No.5, 2002, pp.287-310.

[4] G. Adomavicius, and A. Tuzhilin, "Toward the next generation of recommender systems: a survey of the state-of-the-art and possible ex-tensions," IEEE Trans. Knowledge and Data Engineering, 2005, pp.734 – 749.

[5] M. Deshpande and G. Karypis, "Item-Based Top-N Recommenda-tion," ACM Trans. Information System, 2004, vol. 22, no. 1, pp. 143-177.

[6] **Beginning ASP.NET 4: in C# and VB** by Imar Spaanjaars.

[7] **ASP.NET 4 Unleashed** by Stephen Walther.

[8] **Programming ASP.NET 3.5** by Jesse Liberty, Dan Maharry, Dan Hurwitz.

[9] **Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional, Second Edition** by Matthew MacDonald.

[10] Amazon Web Services (AWS), Online at http://aws. amazon.com.